

REMARKS

Amendments have been made to the specification. Claims 13 and 20 have been amended. No new matter is introduced with these amendments, which are supported in the specification as originally filed. Claims 1 - 20 remain in the application.

I. Rejection under 35 U.S.C. §112, second paragraph

Paragraph 4 of the Office Action dated July 8, 2004 (hereinafter, "the Office Action") states that Claims 13 and 20 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Corrections have been made to the claim dependencies, removing typographical errors, and the Examiner is therefore respectfully requested to withdraw the §112 rejection.

II. Rejection under 35 U.S.C. §102(b)

Paragraph 8 of the Office Action states that Claims 1, 7, and 14 are rejected under 35 U.S.C. §102(b) as being anticipated by Applicants' admitted prior art (hereinafter, "AAPA"). This rejection is respectfully traversed.

Claims 1, 7, and 14 contain limitations not taught by AAPA. For example, the second limitation of these claims specifies computing "a revised cost" for each task by "adding an additional amount of time to the associated cost" for that task. The cited passages of AAPA do not teach this limitation. The text on p. 3, lines 11 - 14 pertains to a scenario where a task's associated cost -- that is, the expected completion time for the task, measured in units of time -- is insufficient for completing the task because execution time of other activities is incorrectly

attributed to the task. However, there is no teaching of computing a revised cost for the task by adding an additional amount of time. Instead, lines 14 - 20 of p. 3 explain that the task will generally fail, as it reaches the end of its expected execution time without having completed.

The cited text on p. 4, lines 5 - 6 also does not teach adding additional amounts of time to the associated cost for tasks, thereby yielding revised task costs. Instead, the cited text states that "NSEs" (i.e., non-schedulable entities) "may account for a very small fraction of the overall execution time ..." in a system. That is, even though some entities, referred to as NSEs, execute without their cost being considered in feasibility computations, the "fraction" of overall execution time that is taken up by these NSEs is, "in many cases", sufficiently small that the feasibility computations are still accurate predictors of whether the other, scheduled tasks can complete on time. However, the cited text does not suggest that the feasibility algorithms (or any other computations) are iteratively executed to add additional amounts of time to the costs of any tasks.

Claim 1 has a fourth limitation which is not addressed by the §102(b) rejection analysis.

For these reasons, Applicants respectfully submit that the §102(b) rejection is improper, and request that the Examiner withdraw it.

III. Rejection under 35 U.S.C. §103(a)

Paragraph 12 of the Office Action states that Claims 1 - 20 are rejected under 35 U.S.C.

§103(a) as being unpatentable over U. S. Patent 6,687,257 to Balasubramanian. This rejection is respectfully traversed.

Balasubramanian teaches techniques for determining message queuing, whereby resources (such as bandwidth) are allocated in advance to a message. See, for example, col. 4, lines 28 - 30 and lines 35 - 38 and col. 7, lines 55 - 63 ("... Prior to any new application program 34 being added to the application list 36, the operating system code 48 intervenes so as to ensure the necessary hardware resources are available ..."). If sufficient resources are not available, then the message is not queued. See, for example, col. 4, lines 23 - 27. Balasubramanian also states that the disclosed techniques can be applied to tasks, whereby resources needed by those tasks are allocated in advance of queuing a task. See col. 3, lines 14 - 16.

However, Balasubramanian does not teach limitations of Applicants' claimed invention. With regard to the independent Claims 1, 7, and 14, for example, Balasubramanian fails to teach "adding an additional amount of time ... thereby yielding a revised cost for each task ..." and "iteratively repeating [computation of task feasibility] and [adding an additional amount of time for each task] ...", which are the second and third claim limitations. Furthermore, with regard to independent Claim 1, Balasubramanian fails to teach "... using the revised cost for each task as an upper limit on execution time ...", which is the fourth limitations. Citations provided in the Office Action for these limitations will now be discussed.

For the "adding an additional amount of time" limitation, the Office Action cites

Balasubramanian's Abstract; col. 13, lines 11 - 31; col. 4, lines 1 - 29; and Fig. 11. Neither the Abstract, the cited text from col. 13, or Fig. 11 contains any discussion whatsoever of adding time. The cited text from col. 14 discusses subtracting, but this is in terms of subtracting an interrupt's execution time from an "interrupt window" and subtracting the interrupt window from a processor's bandwidth that would otherwise be available for user tasks. See col. 14, lines 7 - 9 and lines 21 - 23, respectively. This is not addition, in contrast to Applicants' claim language, and it is not done "for each of the tasks", in contrast to Applicants' claim language. (Furthermore, the subtraction is not done "iteratively", in contrast to the next limitation of Applicants' independent claims.)

For the "iteratively repeating" limitation, the Office Action cites Balasubramanian's col. 11, lines 37 - 40 and Figs. 8a, 8b, 9, and 11. The cited text from col. 11 provides further information regarding the text at lines 25 - 36 of that column. In that earlier text, Balasubramanian teaches considering "whether the bandwidth limits for the task have been violated". This is a task-specific decision performed when a message arrives at a communication card (see col. 11, lines 20 - 24). This is distinct from Applicants' claim limitation, where execution feasibility for a plurality of tasks (see, e.g., Claim 1, lines 3 - 4) is being computed and time is being added to the execution cost of each of those tasks (see, e.g., Claim 1, lines 5 - 6), and these operations are then iteratively repeated (see, e.g., Claim 1, lines 8 - 9). What is described in Balasubramanian's col. 11, lines 37 - 40 is waiting until bandwidth is available for a particular message, and only queuing that message when the bandwidth is available. This is in keeping with Balasubramanian's pre-allocation strategy, which is discussed throughout his

specification. Balasubramanian has no teaching that correlates to Applicants' "iteratively repeating" limitation, and in particular, when that limitation is taken in context of the claim language of the other two limitations to which it refers.

For the "using the revised cost for each task as an upper limit on execution time" limitation of independent Claim 1, the Office Action fails to provide a citation when discussing Claim 1. Applicants refer to the Office Action's discussion of dependent Claim 15, which contains a similar limitation. This discussion cites Balasubramanian's col. 14, lines 21 - 29. What is discussed there is an interrupt window, which is an amount of time available for use by any interrupts that may execute (see col. 13, lines 57 - 58). However, Balasubramanian teaches only a single interrupt window, from which all interrupts must "subtract" their execution time. See col. 14, lines 1 - 5 and lines 7 - 9. This has no correlation to Applicants' claimed task-specific revised costs and task-specific upper limits on execution time.

Accordingly, Applicants respectfully submit that Balasubramanian fails to teach limitations of their independent Claims 1, 7, and 14. These claims are therefore deemed patentable over the reference, as are their dependent Claims 2 - 6, 8 - 13, and 15 - 20. The Examiner is therefore respectfully requested to withdraw the §103(a) rejection.

IV. Conclusion

Applicants respectfully request reconsideration of the pending rejected claims, withdrawal of all presently outstanding rejections, and allowance of all claims at an early date.

Respectfully submitted,



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